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## INFORMATION REPORT

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- Only about 20 percent of the ore needed for the planned production of crude iron in Czechoslovakia is obtained from domestic mines; the remainder must be imported. Because of the difficulties in importing ore from abroad, it was found necessary to look for new sources, one being iron slag, which has not yet been utilized. The Central Office for Research and Technical Development (Ustredi vyzkumu technickeho rozvoje) in Prague suggested that the research plans for 1951 of the Ministry of Heavy Industry include the task of slag research in Slovakia. This task was later transferred to the Research Institute of the Ministry of Light Industry, which has carried out research activity of slag material in Slovakia since the beginning of 1951 with about five or six engineers participating. About May 1951 a special government commission was established to supervise this task. This seems to indicate that the Government has great interest in the results of this research.
- Following is the report of the Institute indicating the results obtained after completion of the first partial task No. 04.04.50. This report is regarded by the Government as strictly confidential. In the Smolnicka Huta (R49/D94) area seven piles of iron slag were identified. In addition to these, two piles of smaller cubature were located and measured in Stara Dolina and Kotlinka.\* The Dobsinska Masa (R49/D66) area was checked for the existence of additional piles as the area is to be irrigated in 1952. (A total of nine piles of iron slag have been uncovered in the Smolnicka Huta, Stara Dolina, Kotlinka and Dobsinska Masa areas. The total cubature of these piles is about 52,896 cubic meters, with an average of 31.06 percent iron the above quantity of slag is estimated to contain about 41,895.5 tons of iron. Taking into consideration that for technical reasons elementary iron can not be determined during analysis, and considering the contents of manganese, it can be expected that the average yield of metal from the slag will be about 35 percent, which corresponds to about 47,210 tons of iron in the slag.
- The elements contained in the slag as found by spectral analysis are as follows: Fe, Sb, Mn, Mg, Pb, Si, Al, Sn, Ca, Zn, Ag, Co, Bi, Ni, Ti, V, Na, Mo, Cr, W, Ga. This shows clearly that the number of elements present in the slag not only confirms the data in the literature concerning this research, but is even higher. The completion of the first partial task concerning five surface piles of slag in the Smolnicka Huta area indicates that a large-scale examination of the Central and Eastern Slovakia area for the purpose of uncovering further slag piles will, in the future, confirm all the assumptions concerning the immense material wealth of the Slovak regions.

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4. Research carried out so far indicates that slags rich in iron can be included among the raw materials to be counted on for the manufacture of iron. Slags containing about 35 percent iron prove to be suitable for processing. The newly-discovered slags are found in accessible piles on the surface and are relatively pure, that is, without admixtures. The possibility of regular supplies depends on proper organization and equipment. Slag can be worked up in foundries in charges together with other richer ores. In case some slag has a higher percentage of copper it can be worked up after the copper has been removed or processed in charges together with ore which has low content of copper. Regarding the analysis of these slags it should be noted that, compared with the currently worked up ores, all the components are suitable for processing, except for the high contents of silicon dioxide which has an unfavorable influence. The problem of working up of these slags in blast furnaces is a question of economy of the produced crude iron. Calcium and magnesium were found by spectral analysis in all the slags. Finding out the quantitative amount of calcium monoxide and magnesium monoxide shall be important in judging the slags with regard to their high contents of silicon dioxide. Calcium monoxide and magnesium monoxide counteract the harmful effects of silicon dioxide. It can be assumed that the presence of silicon dioxide shall be decreased by the considerable contents of base (sic). Nevertheless, it shall most probably be a problem for the Research Institute of the Czechoslovak Foundries to find a method of adaptation of these slags with regard to the substantial removal of silicon dioxide. No arsenic was found in the slags.
5. Iron clay (Fe-hlina) and iron shots (Fe-brok) are found in some areas apart from the piece slags. This material can be worked up by breaking it into clumps (hrudkovani) or agglomeration. According to latest experience modern blast furnaces require a grain size (Kusovost) of about 70 - 80 mm. As the slag found in piles is of various sizes it will be necessary to prepare the slag by crushing it into suitable grainage. The question of economy of manufacture of crude iron from these slags ceases to be of interest should these occur an absolute shortage of metal-bearing charges for blast furnaces.

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